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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/776,844 | 02/11/2004 | Lon J. Wilson | 1789-12301 | 3026 |

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| EXAMINER | |
|---|---|
| PERREIRA, MELISSA JEAN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1618 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 04/04/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/776,844 | WILSON ET AL. | |
| | Examiner | Art Unit | |
| | MELISSA PERREIRA | 1618 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *17 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21,23 and 27-32* is/are pending in the application.

4a) Of the above claim(s) *11-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,23 and 27-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/15/08 has been entered.

### *Priority*

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed application, Application No. 60/356856, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. Provisional application 60/356856 describes the binding of a "drug" to a single-walled nanotubes for release of "drug" into tissues. Single-walled nanotubes are structurally different than fullerenes which are spherical in shape and are comprised of hexagon and pentagon rings that

prevent them from being planar, thus imparting different physical and chemical properties on the fullerene. The encapsulation of a "lipophilic drug" or "drug", such as taxol within the center of a liposome is also described which does not provide information for antibiotics, binding of the "drug" or binding of any targeting agent to the fullerene and there is no mention of fullerene-antibiotic conjugates or the binding of the conjugate of the instant claims to anthrax spores or bone.

The priority date 2/11/03 of provisional Application No. 60/446406 is assigned to group I, claims 1-9 and 27-32 as it refers to the limitations of these claims.

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed applications, Application No. 60/356856, 60/446406, 10367646, 10623110 and 10623190 fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. The prior-filed applications do not disclose the pharmaceutical composition of fullerene-antibiotic conjugates of the instant claims or their use in an aerosol mist for treatment.

The priority date 2/11/04 of the instant Application No. 10776844 is assigned to claims 10 and 23 as it refers to the limitations of these claims.

***Claims and Previous Rejections/Objections Status***

2. Claims 1-21,23 and 27-32 are pending in the application. Claims 11-21 are withdrawn from consideration. Any objections and/or rejections from previous office actions that have not been reiterated in this office action are obviated.

3. The rejection of claims 1-10,23,27 and 28 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn.

4. The rejection of claim 4 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is withdrawn in view of the amendment to the instant claims.

5. The rejection of claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn in view of the amendment to the instant claims.

6. The rejection of claims 1-10,23,27 and 28 under 35 U.S.C. 103(a) as being unpatentable over the combination of Wilson et al. (US 6,660,248B2) in view of the combination of Yan et al. (US 5,830,539) and Stahl et al. (US 5,470,843) and further view of Lei et al. (US 6,777,445B2) is withdrawn. The rejection is withdrawn as the applicant submits that the reference of Wilson et al. (US 6,660,248B2) was commonly owned at the time the invention was made.

7. The declaration under 37 CFR 1.132 filed 12/18/07 is insufficient to overcome the rejection of claims 1-10,23,27 and 28 under 35 U.S.C. 103(a) based upon the rejection as set forth in the last Office action because: the reference of Wilson et al. (US 6,660,248B2) as a 102(e) (file date of 11/9/01) type reference for a 103(a) rejection. Therefore the assertion that the reference of Wilson et al. (US 6,660,248B2) cannot be used as a 102(a) type reference for a 103(a) rejection, "as the invention of the subject matter occurred prior to the publication date of Wilson et al. (US 6,660,248B2)" is moot.

***New Grounds of Rejection***

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim1-10,23,27 and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not adequately describe as to what linking molecules would be acceptable since the specification only provides for malonate or serinol, etc. The substituents, functional groups, properties, etc. required by the linker to be acceptable for the instant invention are not adequately described in the specification.

## 10. *Response to Arguments*

11. Applicant's arguments filed 12/18/07 have been fully considered but they are not persuasive.

12. Applicant asserts that one of ordinary skill in the art would know that the linking molecule "links" the fullerene to the antibiotic and, thus, would easily understand the metes and bounds of the claim.

13. The mere fact that one of ordinary skill in the art would know that the linking molecule "links" the fullerene to the antibiotic would not provide for a clear understanding of the structure of a linking group. It is unclear as to which other functional groups (thiol containing compounds, etc.), molecules (i.e. proteins, peptides, etc.), etc. are capable of linking the antibiotic to the fullerene as the specification merely states malonate or serinol, etc.

## *Claim Rejections - 35 USC § 103*

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claims 1-10,23 and 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yan et al. (US 5,830,539) in view of Lei et al. (US 6,777,445B2) and further in view of Stahl et al. (US 5,470,843).

16. Yan et al. (US 5,830,539) discloses coating/functionalizing substrates, such as fullerenes with a first layer comprising a molecular tether/linker covalently bonded to the surface and a second layer comprising therapeutic agents, diagnostic agents, antibodies, etc. bonded to the first layer (abstract; column 3, lines 9-12 and 42-47; column 4, lines 12-37). The functionalized fullerenes may be converted into devices having further functional groups attached to the first layer, such as targeting ligands (i.e. antigens), antibiotics, etc. (column 6, lines 45-49; column 7, lines 60-63). Yan et al. does not disclose that the molecular tether/linker bonding the first layer to the second (antibiotic) layer may be malonate or diphosphonate.

17. Lei et al. (US 6,777,445B2) discloses a water-soluble fullerene ($C_{60}$) derivative to treat bacterial or viral infections, such as *E. coli*, *Staphylococcus aureus*, etc (column 2, lines 7-14; column 3, lines 8-20; column 4, lines 10 and 18). The water-soluble fullerene ($C_{60}$) derivative ($F[C\text{-}X(Y)_n]_m$) contains multiple $PO_3H$, $SO_3H$, and $CO_2H$ (i.e. malonate) substituents (X and Y) that allows for bone-targeting of the fullerene molecules and where C is a carbon that forms a cyclopropane ring with two vicinal carbons of the fullerene (column 4, formula I; column 5, lines 7-8 and 42-44). The advantage of using fullerene derivatives to treat bacterial or viral infections is the size, hydrophobicity and electronic effects of fullerenes (column 1, lines 61-63). Administration of a pharmaceutical formulation of the fullerene to a patient may include lubricating agents, carriers or may be made into aerosols (column 6, particularly line 48).

18. Stahl et al. (US 5,470,843) discloses a composition comprising a carbohydrate-linker-polymer/potentiator unit. The hydrophilic polymer portion may consist of a hydrophobic fullerene/potentiator unit (column 1, lines 50,57-59 and 61-64; column 6, line 57; column 13, lines 1 and 6; column 14, lines 19-23) and be bound to the carbohydrate via a linker (spacer) (column 7, lines 24-25; column 11, lines 39-41). The compounds of the disclosure may also be coupled/bound to a drug moiety, such as antibiotics/penicillins, erythromycins, etc. (column 14, lines 43-46 and 58+). The role of the potentiator is to improve the affinity of the receptor-binding portion of the molecule or improve the electrostatic interaction of the composition with its cognate receptor and is thus a targeting agent. Also the potentiator improves the overall reactivity of the compound in aqueous solution (column 4, lines 43-52; column 13, lines 6-13 and 20-23). The pharmaceutical compositions/aerosols of the disclosure are suited for the prophylaxis and/or therapy of bacterial and viral infections and of diseases which involve inflammatory processes (column 19, lines 22-27 and 45).

19. At the time of the invention it would have been obvious to one ordinarily skilled in the art to attach multiple therapeutic agents for the treatment of viral infections, such as antibiotics to a fullerene molecule via a linking molecule (Yan et al.). The linking of antibiotics to fullerene gives predictable results, such as treating bacterial and viral infection with fullerenes having improved reactivity and solubility properties in vivo. The use of well known water-soluble fullerene ($C_{60}$) derivatives of Lei et al. to link an antibiotic to the fullerene via the malonate groups is also predictable as the carboxylate group is a known linking substituent. The substitution of one antibiotic (Yan et al.) for

another, such as that of Stahl et al. would be obvious as they are used for the treatment of viral infections. The use of the targeting ligands of Lei et al. with the functionalized fullerenes of the combined disclosures would be obvious and predictable as the disclosures of Lei et al. and Stahl et al. are drawn to the same products (i.e. targeted fullerenes) that have the same utility (treating bacterial and viral infections).

***Response to Arguments***

20. Applicant's assertions are moot in view of the new grounds of rejection.

***Conclusion***

No claims are allowed at this time.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MELISSA PERREIRA whose telephone number is (571)272-1354. The examiner can normally be reached on 9am-5pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Hartley can be reached on 571-272-0616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael G. Hartley/
Supervisory Patent Examiner, Art Unit 1618

/Melissa Perreira/
Examiner, Art Unit 1618

| Application Number | Application/Control No. | Applicant(s)/Patent under Reexamination | |
|---|---|---|---|
| | 10/776,844 | WILSON ET AL. | |
| | Examiner | Art Unit | |
| | MELISSA PERREIRA | 1618 | |